**SUMMARY FOR FE-19-06**
**SELECTED AND POSSIBLE CONTRIBUTING FACTORS**

## SELECTED FACTORS

**Railroad:** Union Pacific Railroad (UP)
**Location:** Cisco, Utah
**Region:** 7

**Month:** October
**Date:** Oct. 26, 2006
**Time:** 4:20 p.m., MST

### Data for Fatally Injured Employee(s)

Spike Puller Operator
46 years old
28 years of service
Last rules training: April 21, 2006
Last safety training: April 21, 2006
Last physical: Jan. 5, 1999

### Data for All Employees (Craft, Positions, Activity)

**Craft: Maintenance of Way**

**Positions:**

**Tie Gang Crew**
Spike Puller Operator
Hi-rail Truck Operator
TKO (tie extractor/inserter machine) Operator
Tie Crane Operator
Spike Driver Operator
Employee in Charge

Railroad Dispatcher

**Activity**

Replacement of cross ties and
tying up equipment

## SUMMARY FOR FE-19-06 CONTINUED
## SELECTED FACTORS CONTINUED

### EVENT

A Spike Puller Operator was fatally injured
when struck by on-truck equipment.

### POSSIBLE CONTRIBUTING FACTORS

**PCF No. 1**

The Spike Puller Operator failed to comply with the railroad's operating rules prohibiting employees from standing on the track in front of an approaching engine, car, or other moving equipment.

**PCF No. 2**

The Spike Puller Operator failed to advise the Machine Operator behind him before he abruptly stopped his machine and dismounted.

**PCF No. 3**

The TKO Operator failed to stay at least 300 feet behind other on-track equipment, trains, or engines while traveling, in non-compliance with the railroad's operating rules.

**PCF No. 4**

The Tie Puller Operator failed to comply with proper railroad procedures for dismounting his machine. He should have dismounted the machine on the field side of the track, away from live traffic; stood beside his machine and directed the next roadway machine operator to a stop; and waited to go between machines until all machines had come to a stop or the Employee in Charge had given permission.

**PCF No. 5**

The Employee in Charge failed to comply with the railroad's operating rules when he gave an inadequate, initial briefing, and then failed to give another briefing when working conditions changed. His initial briefing did not include safe traveling distances between machines and safe procedures for tying up machines. After the tie gang experienced a problem with the tie crane, the Employee in Charge should have given a second briefing and had the tie gang travel closer together, which may have prevented the collision.

**REPORT:** **FE-19-2006**

**RAILROAD:** Union Pacific Railroad (UP)

**LOCATION:** Cisco, Utah

**DATE & TIME:** Oct. 26, 2006; 4:20 p.m., MST

**EVENT[1]:** A Spike Puller Operator was fatally injured when struck by on-track equipment.

**EMPLOYEE:**

| | |
|---|---|
| Craft: | Maintenance of Way |
| Occupation: | Spike Puller Operator |
| Age: | 46 |
| Length of Service: | 28 years |
| Last Rules Training: | April 21, 2006 |
| Last Safety Training: | April 21, 2006 |
| Last Physical: | Jan. 5, 1999 |

## CIRCUMSTANCES PRIOR TO THE ACCIDENT

At 6 a.m., MST, on Oct. 26, 2006, a 6-employee system tie gang crew reported for work at the Green River, Utah Depot (milepost 555.0). The gang members drove their personal vehicles to Thomson, Utah (milepost 528.0) where the tie equipment was stored. The on-track equipment consisted of a hi-rail truck, a spike puller, a TKO (tie extractor/inserter machine), a tie crane, and a spike driver. After receiving a job briefing, which included instructions to wear personal protective equipment, and clearance to occupy the main line, the tie gang proceeded to the work site. The gang was assigned to replace 55 cross ties east of Thompson, Utah, at milepost 523.0. After replacing the cross ties, the tie gang was to travel east on the main line to Cisco, Utah at mile post 504.0 and to tie up (store) the equipment for the following week's work. The weather was clear and sunny, and the temperature was approximately 52° F.

## THE ACCIDENT

After leaving the job site at milepost 523.0 at about 3:30 p.m., the tie gang had a problem with the tie crane's chain drive at about milepost 520.0. The Maintenance Machine Operators

[1] "Event" is defined as "occurrence that immediately precedes and directly results in the fatality." Possible contributing factors are identified in the following report and attached summary.

decided to attach the tie crane to the TKO (tie remover) machine and pull it to Cisco, Utah. Traveling east, the Hi-rail Truck Operator was first to leave, followed by the Spike Puller Operator, the TKO Operator pulling the tie crane, and the Spike Driver Operator. The Hi-rail Truck Operator remained on the track and went ahead to Cisco approximately four miles ahead of the rest of the equipment. The spike puller was ahead of the TKO tie crane by about 3,000 feet, and the spike driver was about 300 feet behind the TKO and crane. Although there is no mechanical device on the machines to accurately determine speed, the TKO Operator estimated he was traveling at 20 mph.

After traversing a left-hand curve and descending a one percent grade, the TKO Operator saw the spike puller about 3,000 feet ahead of his machine, and assumed that the spike puller was still moving east. At about that same time, and for an unknown reason, the Operator of the spike puller machine stopped, dismounted his machine, and moved to a position where he fouled the track. UP officials speculated he might have stopped to put his jacket on, as his safety vest and a work glove were found underneath his body.

The TKO Operator did not notice the tie puller machine was stopped until he was about 150 feet from the spike puller. He applied his brakes and collided with the spike puller machine. The machines traveled an additional 81.3 feet before coming to a complete stop. Due to the impact of the machines, the Spike Puller Machine Operator was apparently thrown onto the rails and run over by his own machine. The speed at impact is unknown. The accident occurred at milepost 508.0, and the time was about 4:20 p.m., MST.

There were two railroad radios with the tie gang, one on the tie crane and the other in the hi-rail truck. After the collision, the Tie Crane Operator radioed for help. His first call was to the Hi-rail Truck Operator and his second was to the Railroad Dispatcher. Emergency personnel from Moab, Utah were dispatched and responded. A medical helicopter was also dispatched to the accident site, but was released after emergency medical personnel on-site pronounced the Machine Operator dead. The deceased was transported to Moab, Utah by Grand County emergency personnel and then transported to the Medical Examiner's office in Salt Lake City, Utah, where an autopsy was performed.

Mechanical inspections of the involved TKO and spike puller machines revealed no defective conditions that caused or contributed to the accident. Post-accident statements of the Maintenance Machine Supervisor indicated that after testing the spike puller, no problems were found with it to indicate why the Operator had stopped his machine. The mechanical inspection of the TKO machine revealed no defects with the braking or others systems that would have contributed to the accident. FRA inspections of the on-track maintenance machines also revealed no conditions that caused or contributed to the accident. Law enforcement investigators ruled the fatality as an accident.

## Conclusion and Analysis

During the safety briefing, the tie gang members were instructed to wear their personal protective equipment while operating their machines. The deceased employee was trained and qualified by the railroad to perform the duties of a Maintenance Machine Operator and was qualified in the operations of moving maintenance machines from one location to another and qualified in the railroad's Roadway Protection Rules. The decedent's attention was inexplicably diverted from what he had been trained to do when he stopped his machine on the main track and stood inside the foul position of the equipment without alerting the Machine Operator who was moving behind him.

The TKO Operator's attention was also diverted from his assigned role of safely moving on-track, maintenance machines from one location to another. The TKO Operator was inattentive and did not keep a lookout for other men and equipment in his direction of travel until the last seconds before his machine collided with the rear end of the spike puller.

Contributing to this accident was the lack of an additional safety briefing, especially when the tie gang experienced a problem with the tie crane. The tie gang could have remained closer together in the event there were additional problems with the machines.

Post-accident toxicology tests performed on the tie gang employees were negative. Tie gang on-track maintenance machines included:

1. A hi-rail truck (which supported the tie gang);

2. A spike puller; SPD 9715 (Narco Super Claw); Serial Number #459; Weight 6,300 lbs.; Year Built 1991; ($1000 damage estimated.);

3. A TKO tie extractor/inserter machine; Serial Number TKO-703; Weight 23,500 lbs.; Year Built 1986; ($1000 damage estimated.);

4. A tie crane; THC-9612 (Jackson 950M); Serial Number 9614; Weight 16,700 lbs.; Year Built 1996; and

5. A Spike Driver; SDAG 5265 (Narco); Serial Number 1076; Weight 21,500 lbs.; Year Built 1995.

# APPLICABLE RULES

Union Pacific Railroad
Operating On-Track Equipment Rules Detail
Oct. 30, 2006

**1.1.2: Alert and Attentive**

Employees must be careful to prevent injuring themselves or others. They must be alert and attentive when performing their duties and plan their work to avoid injury.

**1.1.4: Alert to Train Movement**

Employees must expect the movement of trains, engines, cars, or other movable equipment at any time, on any track, and in either direction.

Employees must not stand on the track in front of an approaching engine, car, or other moving equipment.

**42.2: Maximum Speeds**

The maximum track speed for roadway machines and work equipment is 30 mph.

**42.2.2: Other Speed Requirements**

Track cars and machines must be operated at a speed that will allow the Operator to stop in half the distance the track is seen to be clear.

When approaching workmen or others on or near the track, reduce speed and, if necessary, stop. Operators of on-track equipment (track cars, roadway machines, work equipment, and hi-rails) must ascertain that no employees are fouling the track at a certified control point or interlocking.

**136.3.1: Job Briefing for Roadway Work Groups**

The employee in charge must conduct a job briefing that includes all information related to on-track safety, such as tracks that may be fouled, safe working/traveling distance between machines, or changes in working conditions or procedures.

**136.7.3: Work Zone around Machines**

B. Roadway Machine Operators

Roadway machine Operators must follow these requirements when operating around roadway workers:

3. Do not approach closer than 15 feet to any roadway worker fouling the track without first communicating with the roadway worker.

**136.7.5: Safe Traveling Distance between Machines**

Keep at least 300 feet behind other on-track equipment, trains or engines while traveling.

**43.4: Tying Up Machines**

2. Dismount the machine on the field side of the track, away from live traffic.
3. Stand beside the machine and direct the next roadway machine to a stop.
4. Do not go between machines until all machines have come to a stop or the employee in charge has given permission.